

PENDING CLAIMS AS AMENDED

Please amend the claims as follows:

1. (Currently Amended) A remote station apparatus comprising:
a multi-element antenna configured to receive signals from at least one transmitter and to output highly correlated signals from the respective transmitter; and
a controller configured to receive the highly correlated signals, to determine a spatial signature, including amplitude, angle of arrival and phase for each signal, to estimate a complex covariance matrix and to combine the correlated signals to reproduce the signal transmitted from a selected one of the at least one transmitter.
2. (Original) A remote station as defined in Claim 1, wherein the multi-element antenna is a dual element antenna.
3. (Original) A remote station as defined in Claim 1, wherein the multi-element antenna has an envelope correlation of greater than about 0.7.
4. (Original) A remote station as defined in Claim 1, wherein the controller determines a spatial signature of each signal received from the at least one transmitter.
5. (Currently Amended) A remote station as defined in Claim 1, wherein the controller further comprises a weighting factor engine configured to determine a set of weighting factors for each of the at least one transmitter signals in response to the spatial signatures of the received signals and said complex covariance matrix.
6. (Original) A remote station as defined in Claim 1, wherein the controller further comprises a combiner configured to combine the received signals using the weighting factors to reproduce the signal from a selected one of the at least one transmitter.

7. (Currently Amended) A remote station as defined in Claim 6, wherein the received signals are combined using an optimal combiner, wherein a signal to interference ratio is optimized.

8. (Currently Amended) A remote station as defined in Claim 6, wherein the received signals are combined using a maximal combiner, wherein a signal to interference ratio is maximized.

9. (Original) A remote station as defined in Claim 1, wherein the received signals are CDMA signals.

10. (Currently Amended) A remote station apparatus comprising:

 a multi-element antenna configured to receive signals from at least one transmitter and to output highly correlated signals from the respective transmitter; and

 a controller configured to receive the highly correlated signals from the multi-element antenna to determine a spatial signature, including amplitude, angle of arrival and phase for each signal, to estimate a complex covariance matrix and to combine the correlated signals to maximize the ratio of a preferred signal amplitude to the signal amplitude of the other received signals.

11. (Original) A remote station as defined in Claim 10, wherein the multi-element antenna has an envelope correlation of greater than about 0.7.

12. (Original) A remote station as defined in Claim 10, wherein the multi-element antenna is a dual element antenna.

13. (Original) A remote station as defined in Claim 10, wherein the controller further comprises at least two search engines, each search engine configured to receive in-phase and quadrature signals from an antenna element.

14. (Currently Amended) A remote station as defined in Claim 10, wherein the controller further comprises a weighting factor engine configured to determine a set of weighting factors for each of the at least one transmitter signals in response to the spatial signatures of the received signals and said complex covariance matrix.

15. (Original) A remote station as defined in Claim 10, wherein the controller further comprises a combiner configured to receive in-phase and quadrature signals from each antenna element and weighting factors from a weighting factor engine, and output an optimized in-phase and quadrature signal.

16. (Original) A remote station as defined in Claim 10, wherein the controller further comprises a demodulator configured to receive optimized in-phase and quadrature signals and output a demodulated signal.

17. (Original) A remote station as defined in Claim 10, wherein the received signals are CDMA signals.

18. (Currently amended) A wireless communication system comprising:
at least one base station configured to transmit communication signals; and
at least one remote station configured to receive communication signals from the at least one base station with a multi-element antenna wherein the received signals are highly correlated and are combined to reproduce the signal from a selected one of the at least one base station and configured to determine a spatial signature, including amplitude, angle of arrival and phase, for each signal and configured to estimate a complex covariance matrix.

19. (Original) A wireless communication system as defined in Claim 18, wherein the multi-element antenna is a dual element antenna.

20. (Original) A wireless communication system as defined in Claim 18, wherein the multi-element antenna has an envelope correlation of greater than about 0.7.

21. (Original) A wireless communication system as defined in Claim 18, wherein the at least one remote station further comprises a controller configured to determine a spatial signature of each communication signal received from the at least one base station.

22. (Currently Amended) A wireless communication system as defined in Claim 21, wherein the controller further comprises a weighting factor engine configured to determine a set of weighting factors in response to the corresponding spatial signatures for each of the communication signals received and said complex covariance matrix.

23. (Original) A wireless communication system as defined in Claim 22, wherein the controller further comprises a combiner to combine the communication signals received using the weighting factors to reproduce the signal from a selected one of the at least one transmitter.

24. (Currently Amended) A wireless communication system as defined in Claim 23, wherein the communication signals are combined using an optimal combiner, wherein a signal to interference ratio is optimized.

25. (Currently Amended) A wireless communication system as defined in Claim 23, wherein the communication signals are combined using a maximal combiner, wherein a signal to interference ratio is maximized.

26. (Original) A wireless communication system as defined in Claim 27, wherein the communication signals are CDMA signals.

27. (Currently Amended) A method of processing a multipath signal comprising:
receiving signals from at least one transmitter at multiple antennas;
estimating a complex covariance matrix;
identifying a preferred transmitter among the at least one transmitter, from which a desired signal was received;

producing a signal from each antenna such that the produced signals are highly correlated and contain signal components of a desired signal from the preferred transmitter, and interfering signals;

determining a spatial signature, including amplitude, angle of arrival and phase, for each signal; and

combining two or more of the highly correlated signals to maximize the ratio of the desired signal amplitude to the interfering signal amplitude.

28. (Currently Amended) A method as defined in Claim 27, wherein combining the received signals further comprises:

determining a spatial signature of each signal received from the at least one transmitter;

determining a set of weighting factors for each received signal in response to the spatial signatures of the received signals and said complex covariance matrix; and

reproducing a signal corresponding to the desired signals received from the preferred transmitter using the weighting factors.

29. (Currently Amended) A method as defined in Claim 27, wherein the received signals are combined using an optimal combiner, wherein a signal to interference ratio is optimized.

30. (Currently Amended) A method as defined in Claim 27, wherein the received signals are combined using a maximal combiner, wherein a signal to interference ratio is maximized.

31. (Original) A method as defined in Claim 27, wherein the received signals are CDMA signals.

32. (Currently Amended) A method of processing a signal in a wireless communication system, the method comprising:

receiving a signal from multiple transmitters with a highly correlated multi-element antenna;
estimating a complex covariance matrix;
determining a spatial signature, including amplitude, angle of arrival and phase, of each signal received from the multiple transmitters;
determining a set of weighting factors for each transmitter signal in response to the spatial signatures of the received signals and said complex covariance matrix; and
combining the received signals using the weighting factors to reproduce the signal from a selected one of the multiple transmitters.

33. (Original) A method as defined in Claim 32, wherein the multi-element antenna is a dual element antenna.

34. (Original) A method as defined in Claim 32, wherein the multi-element antenna has an envelope correlation of greater than about 0.7.

35. (Currently Amended) A method as defined in Claim 32, wherein the received signals are combined using an optimal combiner, wherein a signal to interference ratio is optimized.

36. (Currently Amended) A method as defined in Claim 32, wherein the received signals are combined using a maximal combiner, wherein a signal to interference ratio is maximized.

37. (Original) A method as defined in Claim 32, wherein the received signals are CDMA signals.

38. (Currently Amended) A method of processing a signal in a wireless communication system, the method comprising:

means for receiving signals from at least one transmitter at multiple antennas;
means for estimating a complex covariance matrix;

means for identifying a preferred transmitter among the at least one transmitter, from which a desired signal was received;

means for producing a signal from each antenna such that the produced signals are highly correlated and contain signal components of a desired signal from the preferred transmitter, and interfering signals;

means for determining a spatial signature, including amplitude, angle of arrival and phase, for each signal; and

means for combining two or more of the highly correlated signals to maximize the ratio of the desired signal amplitude to the interfering signal amplitude.

39. (Currently amended) A wireless communication system comprising:

means for transmitting communication signals from at least one base station; ~~and~~

means for receiving communication signals by at least one remote station, the remote station configured to receive communication signals with a multi-element antenna wherein the received signals are highly correlated and are combined to reproduce the signal from a selected one of the at least one base station;

means for estimating a complex covariance matrix; and

means for determining a spatial signature, including amplitude, angle of arrival and phase, for each signal.